

A NEW SPECIES OF *PELTOPERLA* FROM EASTERN NORTH  
AMERICA (PLECOPTERA: PELTOPERLIDAE)

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*Abstract.*—A new species, *Peltoperla tarteri* Stark and Kondratieff, from Virginia and West Virginia is described. This new species was previously confused with *P. arcuata* Needham, but males lack the peculiar, basally curved cerci of that species. Both species inhabit springs and springbrooks of the central Appalachians but there are no known occurrences.

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The Nearctic genus *Peltoperla* presently includes a single eastern species, *P. arcuata* Needham (Stark and Stewart, 1981). This species was described from a female adult collected in Ithaca, New York (Needham, 1905). Twenty years later Needham and Claassen (1925) described the male from two specimens taken in Ithaca and at President (Venango County), Pennsylvania. The nymph of this species was reared and described by Claassen (1931), also from Ithaca. Frison (1942) redescribed the male in order to note the unusual cercal shape, previously not emphasized.

During a study of Nearctic peltoperlid genera by Stark and Stewart (1981), specimens lacking this peculiar cercal character were examined from Virginia and West Virginia. These specimens were used to illustrate the male genitalia for the genus *Peltoperla* in the above paper. A study of these and additional material indicates that these specimens actually represent an undescribed species. Terminology used in this paper follows Stark and Stewart (1981).

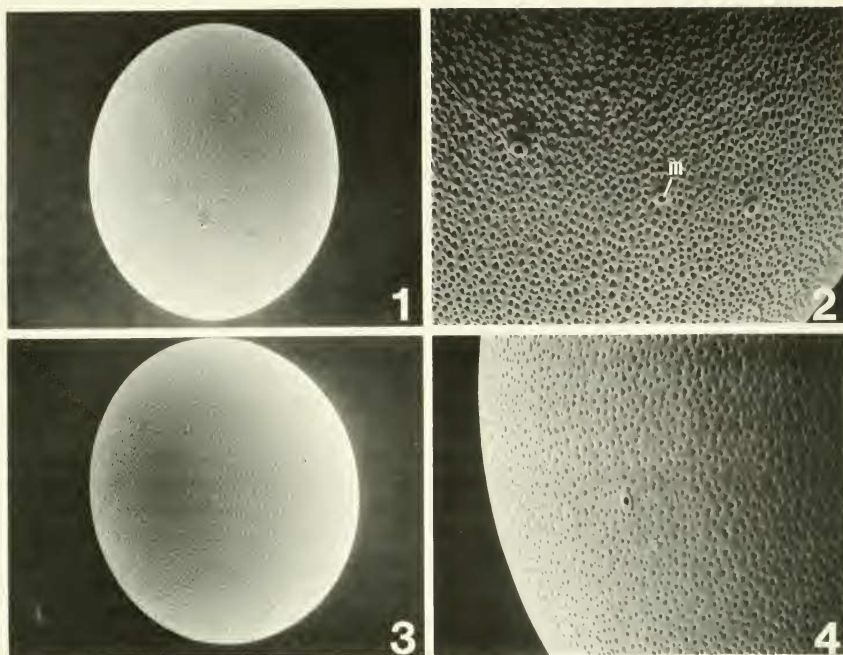
The following museums, institutions and individuals provided material for study: R. W. Baumann, Brigham Young University; O. S. Flint, United States National Museum

of Natural History; R. F. Kirchner, Huntington, West Virginia; J. K. Liebherr, Cornell University; E. C. Masteller, Behrend College; R. F. Surdick, Front Royal, Virginia; and J. R. Voshell, Virginia Polytechnic Institute and State University.

*Peltoperla arcuata* Needham

Needham and Claassen (1925), Frison (1942) and Hitchcock (1974) provided adequate descriptions of this species. We are providing additional comparative figures of the genitalia and eggs to facilitate identification of both species (Figs. 3, 4, 11-15, 17).

Specimens were examined from the following locations: KENTUCKY: Boyd Co., Ashland; Powell Co., Mill Crk, Natural Bridge State Park. NEW YORK: Tompkins Co., Ithaca (holotype); Ringwood. PENNSYLVANIA: Centre Co., Penn-Roosevelt Dam; Elk Co., Ridgeway Spring; Watercress Spring; Erie Co., 6-Mile Crk; Fulton Co., Crystal Spring; Westmoreland Co., Laughintown, Furnace Run. VIRGINIA: Dickerson Co., Laurel Branch, Breaks Int. Park; Shenandoah Co., Springs, Little Sluice Mountain; Wythe Co., East Fork; Stoney Fork Reed Crk. WEST VIRGINIA: Braxton Co., Laurel Run, Falls Mill; Greenbrier



Figs. 1-4. *Peltoperla* eggs. 1, *P. tarteri*, 300 $\times$ . 2, *P. tarteri*, detail of chorion and micropyles (M), 1000 $\times$ . 3, *P. arcuata*, 340 $\times$ . 4, *P. arcuata*, detail of chorion and micropyles, 1000 $\times$ .

Co., Coats Run, North Fork Cherry Riv; Logan Co., Frogtown Hollow Copperas Mine Fork; Mingo Co., Laurel Fork Pigeon Crk; Pocahontas Co., Fork of Tea Crk.

***Peltoperla tarteri* Stark and Kondratieff,  
NEW SPECIES**

*Peltoperla arcuata*: Stark and Stewart (1981),  
in part.

Male.—Forewing length 11–12.5 mm. General color brown patterned with pale brown. Tergum 9 unmodified, without dorsal lobe. Paraprocts and tergum 10 typical of genus. Cerci essentially straight; first segment elongate but not swollen basally (Figs. 5, 8, and 9). Vesicle on sternum 9 slightly wider than long and rounded apically (Fig.

6). Aedeagus membranous and multilobed; apex terminates in two sparsely setose lateral lobes and 3 mesal finger-like lobes covered with fine spicules; a pair of spiculate mesolateral lobes are occasionally not everted (Fig. 10).

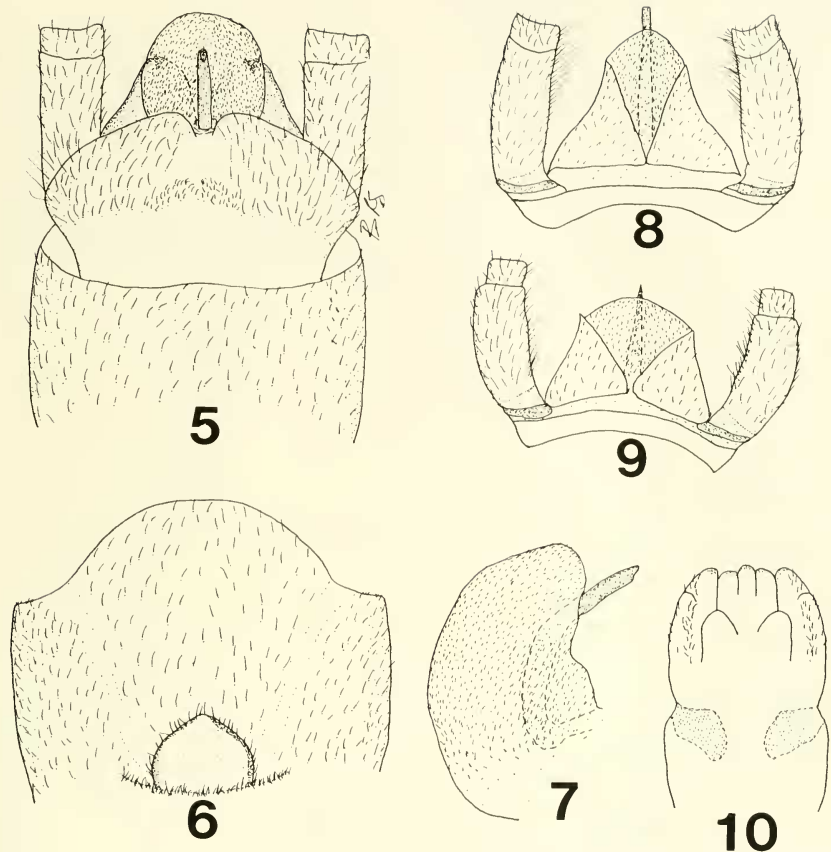
Female.—Forewing length 12–13.5 mm. Subgenital plate truncate apically; vaginal sclerite sides parallel (Fig. 16).

Egg.—Spherical to slightly ovoid; collar absent. Chorionic surface finely punctate giving surface a rough appearance. Micropyles typical of genus (Figs. 1, 2).

Nymph.—Presently indistinguishable from *P. arcuata*.

Etymology.—This species is named in honor of Donald C. Tarter, Marshall University, Huntington, West Virginia.

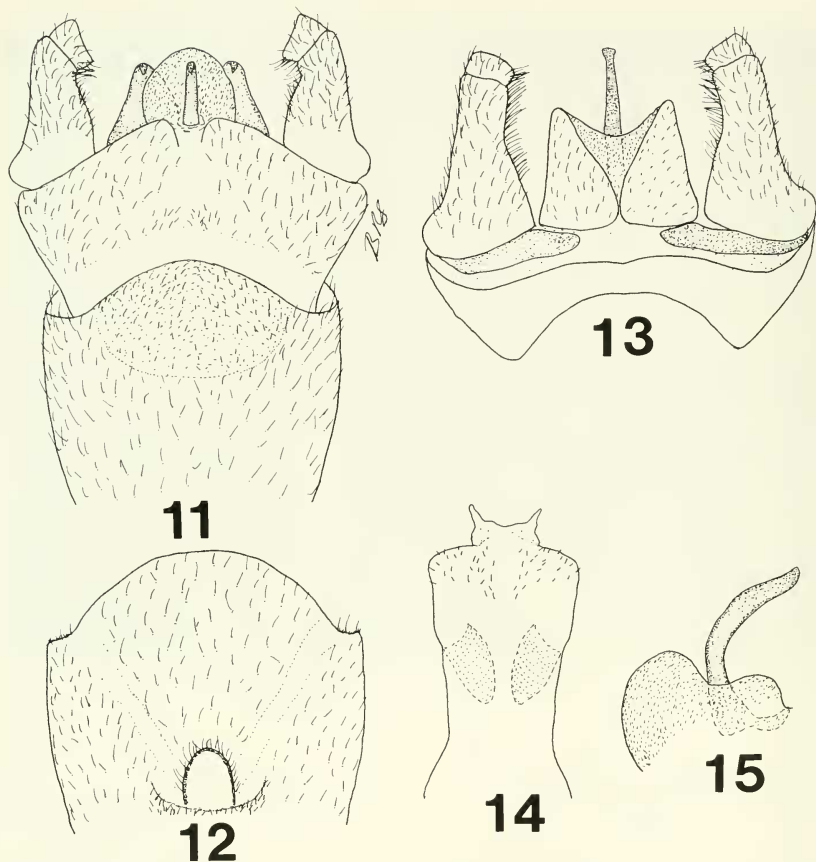
Material examined.—Holotype  $\delta$ , allo-



Figs. 5-10. *P. tarteri*, male genitalia. 5, Terminalia dorsal. 6, Sternum. 7, Epiproct, lateral. 8, Paraprocts and epiproct, ventral (Giles Co., Virginia). 9, Paraprocts and epiproct, ventral (Wyoming Co., West Virginia). 10, Aedeagus, ventral.

type ♀, 23 paratype ♂ and 43 paratype ♀, West Virginia, Fayette Co., Big Hollow of Paint Creek, 19 May 1979, R. F. Kirchner. Additional paratypes: VIRGINIA: Craig Co., Hollow Hill Farms, 26 June 1977, B. Kondratieff, 1 ♂, 1 ♀ (VPI); Floyd Co., tributary of Little Riv., 8 June 1978, B. Kondratieff, 5 ♂ (VPI); Giles Co., Little Stony Crk, 14 July 1971, M. Kosztarab, 2 ♂ (USNM); same location, 26 June 1977, B.

Kondratieff, 3 ♂, 1 ♀ (VPI); same location 24 June 1978, B. Kondratieff, 7 ♂, 1 ♀ (VPI); Mountain Lake, small spring on Co. Rt. 700, B. Kondratieff, 1 ♂, 1 ♀ (BPS); Mud Branch, Mountain Lake, 26 June 1977, B. Kondratieff, 6 ♂, 2 ♀ (VPI); Virgin Timber Area, Mountain Lake, 15/18 July 1978, K. A. and C. R. Parker, 5 ♂, 1 ♀ (VPI); Spring near Co. Rt. 613, 24 June 1978, B. Kondratieff, 9 ♂, 5 ♀ (VPI); Greene Co., Pocosin Cabin, Shen-

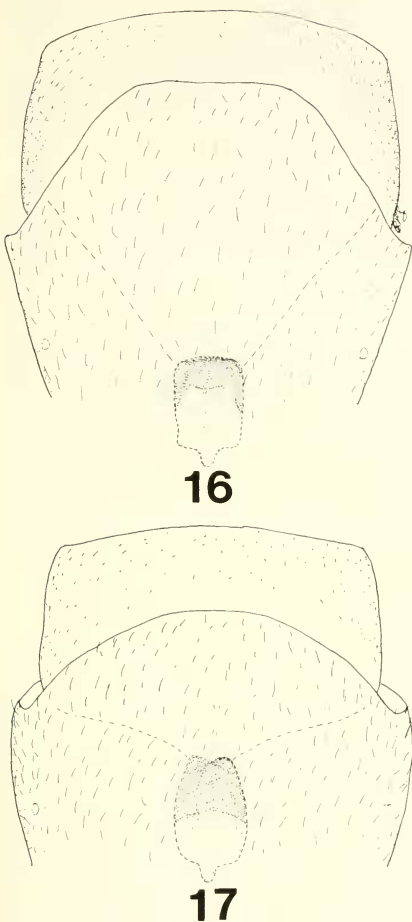


Figs. 11-15. *P. arcuata*, male genitalia. 11, Terminalia dorsal. 12, Sternum 9. 13, Paraprocts and epiproct, ventral. 14, Aedeagus, ventral. 15, Epiproct, lateral.

Shenandoah National Park, 20 July 1973, O. S. Flint, 1 ♂, 1 ♀ (USNM); Nelson Co., Stony Crk, Co. Rt. 751, 28 June 1983, 1 ♂ (BPS); Patrick Co., Spring into Rock Castle Crk, 10 May 1983, B. Kondratieff, 1 ♂, 1 ♀ (BCK); Rockingham Co., Shenandoah National Park, 30 May 1976, O. S. Flint, 1 ♂, 1 ♀ (USNM); Rappahannock Co., Shenandoah National Park, Skyline Drive MP 71, 24

June 1961, O. S. Flint, 4 ♂, 1 ♀ (USNM). WEST VIRGINIA: Wyoming Co., Clear Fork Guyandotte Riv, 19 March 1978 (reared), L. Evans, 3 ♂ (RFK).

The holotype and allotype are deposited in the United States National Museum of Natural History (USNM), the paratypes in the authors' collections (BPS, BCK), and in those of R. F. Kirchner (RFK), Virginia



Figs. 16, 17. *Peltoperla* female genitalia. 16, *P. tarteri*. 17, *P. arcuata*.

Polytechnic Institute and State University (VPI), and the Monte L. Bean Museum, Brigham Young University (MLBM).

**Diagnosis and discussion.**—Males of *P. tarteri* are easily separated from *P. arcuata* by the absence of the curved cerci and by the lack of a dorsal lobe on tergum 9. The

aedeagal apex is also quite different, being apically multilobed in *P. tarteri* (Fig. 10). The epiprocts of both species are variable. Figures 8, 9 indicate the range of variation for this structure in *P. tarteri*.

Females of both species are similar; however, the subgenital plate of *P. tarteri* is longer and typically more truncate apically, whereas that of *P. arcuata* is broadly rounded apically. Internally the vaginal sclerite of *P. arcuata* is broader across the anterior margin than posteriorly, whereas in *P. tarteri* the sides of the sclerites are parallel. The eggs are similar for both species, although subtle differences are evident in Figs. 2 and 4. Nymphs of both species are very similar and examination of reared material provided no useful characters for separation.

The distribution of these species is somewhat enigmatic, since their ranges overlap broadly in the Blue Ridge, Ridge and Valley and Appalachian Plateau physiographic provinces of Virginia and West Virginia. Both species of *Peltoperla* typically occur only in crenon habitats (spring sources and springbrooks) of the higher, central Appalachians. The two species have not been taken together, however, they are often collected with species of *Tallaperla* such as *T. anna* (Needham and Claassen) and *T. maria* (Needham and Claassen).

#### ACKNOWLEDGMENTS

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#### LITERATURE CITED

- Claassen, P. W. 1931. Plecoptera nymphs of North America north of Mexico. Thomas Say Found. Entomol. Soc. Am. 3: 1-199.
- Frison, T. H. 1942. Studies of North American Plecoptera with special reference to the fauna of Illinois. Bull. Ill. Nat. Hist. Surv. 22: 235-355.
- Hitchcock, S. W. 1974. Guide to the insects of Con-

- necticut. Part VII. The Plecoptera or stoneflies of Connecticut. State Geol. Nat. Hist. Surv. Conn. 107: 1-262.
- Needham, J. G. 1905. New genera and species of Perlidae. Proc. Biol. Soc. Wash. 18: 107-110.
- Needham, J. G. and P. W. Claassen. 1925. A monograph of the Plecoptera or stoneflies of America north of Mexico. Thomas Say Found. Entomol. Soc. Am. 2: 1-397.
- Stark, B. P. and K. W. Stewart. 1981. The nearctic genera of Peltoperlidae (Plecoptera). J. Kans. Entomol. Soc. 54: 285-311.